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1060-79 Predictors of Life-Threatening Ventricular Arrhythmias in High-Risk Patients With ST Elevation Acute Myocardial Infarction

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Background: There is little known about clinical predictors of ventricular arrhythmias (VA) in high risk patients with STE acute myocardial infarction (STE AMI), like the elderly and those not receiving reperfusion therapy. These groups may have unique risks for VA.
Methods:The MAGIC Study was an NHLBI-sponsored randomized trial testing if early use of intravenous magnesium in high risk patients with STE AMI (patients ≥ 65 years old and patients of any age who were not candidates for reperfusion therapy) would reduce mortality. The need for defibrillation due to VF or pulseless VT was recorded. We analyzed characteristics associated with VA to define predictors in these groups.
Results: Of the 6210 patients analyzed, only 296 (4.8%) had defibrillation for VF or pulseless VT during hospitalization. The occurrence of VA did not differ by gender, by history of hypertension, diabetes, prior AMI, prior CABG or stroke. There were many univariate predictors of developing VA. A logistic regression model of predictors was developed (Table).
Conclusion: We observed a clear association of pulseless VT or VF with heart failure at time of hospitalization, relative hypotension at time of presentation and advanced age. The striking association in risk reduction for pulseless VT or VF with use of ACE inhibitors merits further investigation. Further work is needed to clarify how best to reduce the risks for pulseless VT or VF in high risk STE AMI patients.

Odds RatioTable

Variable	Odds Ratio	95 % CI	p-value
Pulmonary congestion	1.49	1.07,2.06	0.017
Age 65-74 (vs < 65)	1.45	1.07, 1.95	0.015
Age > 75 (vs < 65)	1.25	0.90, 1.74	0.2
SBP < 100 (vs > 140)	2.88	1.50, 5.56	0.002
SBP 100-139 (vs > 140)	1.58	1.23, 2.03	0.003
Ant + Inf MI (vs Inf only)	2.31	1.33, 4.00	0.003
Anterior MI (vs Inf MI)	1.04	0.81, 1.34	0.7
LBBB +/- other vs (Inf MI)	1.07	0.59, 1.96	0.8
Ace inhibitor Rx	0.60	0.46, 0.77	<0.0001
Diuretic Rx	1.35	1.01, 1.75	0.03
Beta Blocker Rx	0.82	0.64, 1.05	0.1

1060-80 Female Sex: A More Important Prognostic Marker Than Treatment Assignment or Comorbid Conditions Among Patients With Acute Myocardial Infarction in the GUSTO V Trial

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Background: Women with acute MI (AMI) are more likely than men to have recurrent MI, bleeding or death. It has been hypothesized that this difference is due to older age, longer treatment delay and more comorbidities in women. Use of diagnostic and therapeutic modalities may also differ between the sexes. There is controversy as to whether female sex is an independent risk factor for death and/or bleeding complications.
Methods: GUSTO V studied the use of standard dose rPA vs. the combination of a standard dose of abciximab and half-dose rPA in AMI. We report the analysis of sex differences in mortality and bleeding complications.
Results (see Table): Women with AMI were more likely to die or have bleeding complications; women were older and had higher rates of DM, HTN than men. After Killip class, female sex was the strongest correlate of death. There was no association between treatment assignment and death in either sex; bleeding was more common in both sexes receiving combination therapy. Angiography and PCI were less frequent in women but there was no interaction between sex and use of angiography or PCI on outcome. On multivariate analysis, female sex was independently associated with mortality. Female sex also predicted bleeding independent of treatment assignment.
Conclusions: Female sex is an independent predictor of death and bleeding complications among patients with AMI treated with a fibrinolytic regimen. There remains a differential between the sexes in the use of angiography and PCI after fibrinolysis.

	Multivariate Odds Ratio (95% CI)	**P**
Death (7d)	1.61 (1.35, 1.91)	.002
Death (30d)	2.00 (1.59, 2.53)	<0.001
Bleeding	1.31 (1.18, 1.46)	<0.001
	Multivariate Hazard Ratio (95% CI)	**P**
Death (1yr)	1.14 (1.01, 1.29)	0.03

1060-81 Multiple Complex Plaques in Unstable Saphenous Vein Grafts

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Background Recent observations document that patients with acute coronary syndromes (ACS) often manifest multiple complex unstable plaques (MCP) in native coronary arteries, consistent with destabilizing processes exerting adverse influences throughout diffusely atherosclerotic vessels. Whether siimilar angiographic patterns occur in unstable saphenous vein grafts (SVG) has not been shown.
Methods We retrospectively analyzed angiograms from 189 patients with acute coronary syndromes attributable to SVG culprits. Criteria for plaque complexity included at least two of the following: (1) filling defect; (2) ulceration; or (3) impaired flow. Multiple discrete complex lesions in a single graft were defined as lesions as lesions separated by at least 10 mm of normal vessel. Proximal total occlusions were excluded.
Results Overall, MCP were documented in 66 (35%) of patients; 46 (24%) of those had MCP in a single graft, and 20 (11%) had multiple grafts with MCP. Over 1 year, compared to patients with single complex plaques, those with MCP had a higher incidence of revascularization overall (27.6% vs 45.5%, P=0.014), both due to restenosis in the initial culprit lesion (19.5% vs 31.8%, P=0.05), as well as progression of new non-culprit lesions (8.1% vs 21.2%, P=0.01)
Conclusions These findings demonstrate that patients with ACS due to unstable SVG frequently harbor multiple unstable plaques in one or more grafts, the presence of which is associated with unfavorable clinical outcomes.

1060-82 Prognostic Value of Ventricular Arrhythmias in Patients With Unstable Angina

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The prognostic value of ventricular arrhythmias in patients with unstable angina remains unknown.
We reviewed the 24-hour electrocardiographic Holter monitorings (HM) of 475 patients with unstable angina (age 65±10 years, 357 men), enrolled in the prospective Italian study "Stratificazione Prognostica dell'Angina Instabile" (SPAI), who had complete clinical follow up at 6 months. HM was started within 24 hours from admission. As an inclusion criterion, all patients had left ventricular ejection fraction >40%.
Frequent premature ventricular complexes (PVCs, >=10/hour) were detected in 91 patients (19.2%), non sustained ventricular tachycardia in 54 (11.4%), and complex PVCs (frequent and/or repetitive PVCs, including couplets) in 164 (34.5%).
Overall, there were 32 total deaths (6.7%), 29 of which (6.1%) of cardiac origin, during follow-up. Deaths occurred in 14 patients (15.4%) with, and in 18 patients (4.7%) without, frequent PVCs (odds ratio [OR] 3.70, p<0.0003); moreover, total mortality was 14.6% among patients with, and 2.6% among those without, complex PVCs (OR 6.49, p<0.00001). Non sustained ventricular tachycardia was not by itself associated with mortality in this study. The detection of complex PVCs was an independent predictor of mortality (OR, 3.93 [95% CL, 1.58-9.79], p<0.005) on multivariate logistic regression analysis, including potential clinical (age, gender, diabetes, hypertension, previous myocardial infarction, angina recurrence) and laboratory (transient myocardial ischemia on Holter recording, troponin I and C-reactive protein levels) variables.
In conclusion, this study shows that the detection of frequent or complex ventricular arrhythmias on 24-hour ambulatory ECG monitoring in the earlier hours after hospital admission is a strong and independent predictor of clinical events in patients with unstable angina.

1060-83 Calcification of the Culprit Lesion Is Associated With Adverse Clinical Outcomes in ST Elevation Myocardial Infarction Patients Treated With Fibrinolytic Therapy

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Background: Coronary artery calcification has been associated with a greater extent of disease, but whether it is independently associated with clinical outcomes has not been fully evaluated.
Methods: We hypothesized that culprit lesion calcification is associated with adverse outcomes in patients with ST-elevation myocardial infarction (STEMI). Clinical & angiographic data were analyzed from 3,292 patients enrolled in the TIMI 10A, 10B, 14, 20, 23, and 24 trials of fibrinolytic therapy in STEMI.
Results: 7.4% of patients (243/3292) had culprit lesion calcification. Baseline characteristics associated with culprit lesion calcification were increased age (59.7 ± 10.5 vs. 57.9 ± 10.8, p=0.01), prior MI (17.7% vs. 11.9%, p=0.008), residual thrombus (57.6% vs. 35.5%, p<0.0001), increased disease extent (25.3% vs. 17.3% 3 vessel disease, p=0.003), and the presence of a closed artery at 60 minutes after fibrinolytic therapy (33.3% vs. 19.6%, p<0.0001). Culprit lesion calcification was associated with increased 30-day mortality (6.2% vs. 3.4%, p=0.028) and the composite of 30-day death/MI/CHF (16.5% vs. 8.9%, p<0.0001). In a multivariate model that incorporated age, time to treatment, prior MI, gender, LAD location, residual thrombus, disease extent, and artery patency at 60 minutes, culprit lesion calcification remained independently associated with 30-day death/MI/CHF (OR 1.64, p=0.026). In a similar model restricted to patients with open arteries at 60 minutes, culprit lesion calcification remained independently associated with 30-day mortality (OR 2.76, p=0.016).

Conclusion: Culprit lesion calcification on angiography is independently associated with adverse clinical outcomes in STEMI patients, irrespective of culprit artery patency, presence of thrombus, age, history of prior MI and disease extent.

1060-84 **The Impact of Contemporary Guideline Compliance on Risk Stratification Models for Acute Coronary Syndromes in The Registry of Acute Coronary Syndrome (TRACS)**

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Background: Because acute coronary syndromes (ACS) represent a major public health issue, risk stratification models for ACS have been developed to aid physicians in decision-making, directing management and predicting prognosis. This study compares the predictive value of the RUSH Score and the Thrombolysis in Myocardial Infarction (TIMI) Risk Score in an unselected patient population with ACS, and evaluates the impact of compliance with established guidelines on the accuracy of these models. *Methods:* The Registry of Acute Coronary Syndromes (TRACS) is a retrospective registry of 3754 consecutive patients presenting with ACS to the emergency department between April1, 1999 to December 31, 2000 at 9 participating hospital centers (tertiary and community). Patients less than 25 years old (N=8) and with incomplete data (N=1) were excluded. The primary endpoint was all-cause mortality, myocardial infarction (MI) and/or urgent revascularization during hospitalization. RUSH scoring is based on quartiles of predicted risk of cardiac complication (Class I: <2% vs. IV: >15%). The TIMI score was implemented as published. Compliance with current medical treatment recommendations for ACS was assessed using a 4-point scale based on the aggregate use of aspirin, beta-blockers, heparin and glycoprotein IIb/IIIa inhibitors. *Results:* The mean age was 67±14 years, 38% female, 86% Caucasian. 9% died, 6% had a MI, 27% underwent revascularization but in only 1% was it urgent. The primary endpoint rates for TIMI score 0/1, 2, 3, 4, 5 and 6/7 were 11%,14%,13%, 11%,14% and 12% respectively (P=NS). The primary endpoint rates for RUSH class I, II, III and IV were 6%, 8%, 9% and 17% respectively (P<0.001). After controlling for compliance with established guidelines, the gradient of increased by 46% for each unit increase in RUSH class (P<0.001). Adjusting for the RUSH Class, the odds ratio decreased by 54% for each unit increase in compliance (P<0.001).*Conclusions:* The use of established risk scores overestimate event rates in unselected populations. Compliance with the current American College of Cardiology/American Heart Association guidelines significantly improves prognosis regardless of the risk score.

1060-101 **Angiographically Apparent Thrombus After Fibrinolytic Administration Is Associated With Impaired Epicardial Flow and Myocardial Perfusion in ST Elevation Myocardial Infarction Patients With Open Arteries**

Ajay J. Kirtane, Dimitrios Karmpaliotis, Aaron Weisbord, Anh Bui, Sabina A. Murphy, Daniela Budiu, Ioanna Kosmidou, Julian M. Aroesty, Robert P. Giugliano, Christopher P. Cannon, Elliot M. Antman, Eugene Braunwald, C. Michael Gibson, Beth Israel Deaconess Medical Center, Boston, MA, TIMI Study Group, Harvard Medical School, Boston, MA

Background: Residual thrombus following fibrinolytic administration in ST-elevation myocardial infarction (STEMI) may reflect a larger overall thrombotic burden, which may in turn predispose to microembolization and impaired myocardial perfusion.
Methods: We hypothesized that angiographically-evident residual thrombus after fibrinolytic therapy in STEMI patients is associated with worsened indices of epicardial & myocardial perfusion, even in the presence of an open infarct-related epicardial artery. Clinical & angiographic data were analyzed from 929 patients with open arteries (TIMI Flow Grade 2/3 at 60 minutes after fibrinolytic therapy) who were enrolled in the TIMI 14, 20, 23, and 24 trials in STEMI.
Results: Residual thrombus was found in 37.8% of patients (351/929). Baseline characteristics associated with residual thrombus were non-LAD infarct location (72.1% in arteries with thrombus vs. 60.7% in arteries without thrombus, p<0.0001) and a history of hypercholesterolemia (27.6% vs. 21.5%, p=0.03). Residual thrombus was associated with higher Corrected TIMI Frame Counts (CTFC) in the infarct-related artery (43.5 ± 36.2 with thrombus vs. 36.1 ± 23.9 without thrombus, n=907, p=0.0002), impaired microvascular perfusion by TIMI Myocardial Perfusion Grade (57.0% TMPG 2/3 with thrombus vs. 70.0% TMPG 2/3 without thrombus, n=929, p<0.0001), and a trend toward a lower percentage of complete (>70% of baseline) ST-segment resolution (35.6% complete resolution with thrombus vs. 40.3% complete resolution without thrombus, n=722, p<0001). In multivariate regression models that incorporated age, time to treatment, gender, a history of hypercholesterolemia, LAD location, and TIMI Flow Grade, residual thrombus remained independently associated with slower flow by CTFC (p=0.01), impaired TMPG (OR for TMPG 2/3 0.66, p=0.004) and less complete ST-segment resolution (OR for complete resolution 0.71, p=0.038) in patients with an open infarct-related artery.
Conclusion: Angiographically-apparent thrombus after fibrinolytic administration is independently associated with slower epicardial flow and impaired myocardial perfusion, despite a patent epicardial artery.

1060-102 **Risk Scores Derived From Clinical Trials Do Not Generalize to Real World Acute Coronary Syndrome Patients: Insights From the Canadian Acute Coronary Syndromes Registry**

Andrew T. Yan, Philip Jong, Raymond T. Yan, Mary Tan, Robin A. Kuritzky, Laura Drozdiak, Chi-Ming Chow, David H. Fitchett, Anatoly Langer, Shaun G. Goodman, Canadian Heart Research Centre, Toronto, ON, Canada, University of Toronto, Toronto, ON, Canada

Background: Accurate risk assessment can guide clinical decision making in the management of acute coronary syndromes (ACS). Several risk models have been derived from and validated in clinical trials and other selected patient cohorts, but their applicability in the general population remains unclear.
Methods: In the prospective, observational Canadian ACS Registry, 4627 patients with ACS were enrolled from 51 centres. Baseline patient data were recorded on standard case report forms. We evaluated the risk models derived from the Platelet glycoprotein IIb/IIIa in Unstable angina: Receptor Suppression Using Integrilin Therapy (PURSUIT) and the Global Registry of Acute Cardiac Events (GRACE) predicting in-hospital death among patients with non-ST elevation (NSTE) ACS. Model discrimination was measured by the c statistic which represents the area under the receiver operating characteristic (ROC) curve. Calibration was assessed by the Hosmer-Lemeshow goodness-of-fit test, where a low probability value indicates lack of fit.
Results: In-hospital mortality rates were 2.4% overall and 1.5% among the NSTE ACS patients (N=2925; 63.2%) in our validation cohort. Both the PURSUIT and GRACE risk models showed similar and good prognostic discrimination (c statistics= 0.84 and 0.83, respectively; P=0.69 for difference). The GRACE model showed good calibration (Hosmer-Lemeshow P=0.40). In contrast, calibration in the PURSUIT model was poor (Hosmer-Lemeshow P<0.001) with consistent over-estimation of risks. Performance of the GRACE model was similar when ST-elevation ACS patients were included.
Conclusions: Both the PURSUIT and GRACE models demonstrated good discrimination for in-hospital mortality in the Canadian ACS Registry. However, the GRACE risk model, derived from a less selected population, provided superior calibration in risk assessment across the spectrum of ACS. Our findings underscore the importance of risk model validation in the general population to establish its generalizability before integration into clinical practice.

POSTER SESSION

1061

New Observations From Acute Myocardial Intervention Trials II

Monday, March 08, 2004, 9:00 a.m.-11:00 a.m.
Morial Convention Center, Hall G
Presentation Hour: 9:00 a.m.-10:00 a.m.

1061-85 **Trends in the Use of Effective Cardiac Medications in Patients With Acute Myocardial Infarction: The GRACE Experience**

Robert J. Goldberg, Frederick A. Spencer, Ph. Gabriel Steg, José López-Sendón, Brian M. Kennelly, Marcus D. Flather, Gilles Montalescot, Enrique P. Gurfinkel, Polina Kuznetsova, Joel M. Gore, The GRACE Investigators, University of Massachusetts Medical School, Worcester, MA

Background There are increasing data supporting the routine use of certain effective medications in the treatment of patients with acute myocardial infarction (AMI). However, few data are available describing recent, as well as temporal, trends in utilization rates of these medications in patients with AMI. Moreover, few contemporary data are available from a multinational multicenter perspective.
Methods To examine recent (2000-2002) patterns in the use of effective cardiac medications, we examined data from 15,972 patients hospitalized with AMI at 94 hospitals in 14 countries included in the Global Registry of Acute Coronary Events (GRACE). The four medications examined include aspirin, beta blockers, ACE inhibitors, and lipid-lowering agents.
Results Overall, 1.5% of patients did not receive any of these 4 medications during the acute hospitalization, 6.2% received only 1 treatment modality, 21.7% received any 2 medications, 38.6% received any 3 medications, and 32.0% received all 4 cardiac medications. There was a marked increase over time in the proportion of patients receiving all 4 medications during their index hospitalization (23.5% in 2000, n=7196; 40.7% in 2002, n=6919). The most marked increases in the prescribing of these effective cardiac medications over time were noted for lipid-lowering agents (17% relative increase) followed by increases in ACE inhibitors (10%). Use of aspirin and beta blockers remained relatively stable during the periods examined. Increases in the prescribing of all 4 medications over time were observed in various demographic and clinically defined subgroups. In addition, there were marked increases over time in the prescribing of multiple cardiac medications to patients in the different GRACE strata of low, moderate, and high risk.
Conclusion The results of this large multinational observational study provide insights into changing prescribing patterns in the hospital management of AMI. Despite encouraging increases in the use of combinations of effective cardiac therapies, considerable opportunities for increased utilization remain.